4. The United States Will Maintain Its Technological Lead in Digital Television While Creating High-Skill, High-Wage Jobs for American Workers

The United States is now the world leader in digital television. If we move ahead rapidly with the implementation of HDTV, the effect on the U.S. economy could be felt for decades through the creation of thousands of high-skill, high-wage jobs.

At a minimum, the transition from analog to digital television will create jobs for American workers in the design and manufacture of HDTV displays, integrated circuits and other components, studio and transmission equipment, as well as in the development of programming and software for HDTV applications.

More generally, the widespread deployment of the Grand Alliance system will create export opportunities and stimulate key domestic industries such as computers, communications, semiconductors, and displays, as well as related fields such as education and medical imaging.

In order to maintain this technological lead, the U.S. must move quickly and aggressively. Other countries may introduce one or more digital HDTV standards in the near future. If the U.S. acts expeditiously, other countries can be expected to adopt all or part of the U.S. technology in establishing their standards. If the U.S. delays its decision, we risk losing our technological lead and allow foreign competitors to establish preeminence in the marketplace. The rapid establishment and commercialization of the Grand Alliance High Definition System will drive a variety of technology sectors, but this economic stimulus will only be realized when HDTV services and products are readily available in the marketplace.

V. CONCLUSION

This moment marks a critical juncture in the development of advanced television. The ACATS's recommendation that the FCC adopt the Grand Alliance HDTV system culminates nearly a decade of Herculean effort from America's finest engineers and most technologically advanced companies, working under the bipartisan guidance of the U.S. government.

To maintain our momentum, the FCC must quickly move forward and adopt a digital TV standard based upon the Grand Alliance system as recommended by the Advisory Committee. It is equally critical that local broadcasters be assigned licenses for their digital channels as rapidly as possible. Any delay at this point would squander the fruits of eight years of work and hundreds of millions of dollars invested, while needlessly delaying the hundreds of thousands of new, high quality jobs that would be created by transition to digital broadcast.

HDTV is an American technology success. Our commitment to the rapid deployment of HDTV will ensure the United States' economic leadership, international competitiveness, and quality of life well into the 21st century.

The Electronic Industries Association Advanced Television Committee (EIA/ATV) is composed of a diverse array of organizations, including developers, installers, manufacturers, sellers, and installers of equipment used in the broadcast, cable television satellite, telecommunications, and consumer electronics industries, as well as providers of video delivery services. The EIA/ATV Committee is dedicated to ensuring that the transition from today's analog environment to tomorrow's digital world is as seamless and inexpensive as possible for consumers. Towards this end, the Committee has actively participated in each phase of the eight-year ACATS rulemaking process.

FCC Advisory Committee on Advanced Television Service

BACKGROUNDER

DIGITAL HDTV TEST RESULTS

Grand Alliance HDTV System Shines in Technical Evaluations

WASHINGTON, Nov. 28, 1995 -- When it made its final high-definition television (HDTV) standard recommendation today, the FCC Advisory Committee on Advanced Television Service approved the results of extensive laboratory and field testing of the Digital HDTV Grand Alliance system.

Technical evaluations performed in 1995 included objective laboratory testing conducted by the Advanced Television Test Center in Alexandria, Va., and Cable Television Laboratories, Inc. (CableLabs) of Boulder, Colo., subjective viewer testing conducted by the Advanced Television Evaluation Laboratory in Ottawa, Canada, and field testing in Charlotte, N.C., conducted by the Public Broadcasting Service, the Association for Maximum Service Television Inc. (MSTV) and CableLabs.

The laboratory and field tests evaluated the Grand Alliance system's four principal subsystems: scanning formats, video and audio compression, transport and transmission:

- Each of the proposed HDTV scanning formats exceeded targets established for static and dynamic luminance and chrominance resolution. Five progressive-scanning formats and one interlaced-scanning format comprise the HDTV formats: 24-, 30-,

and 60-frame-per-second progressive scan with a pixel format of 1280 x 720 (number of active picture elements per line time the number of active lines), 24- and 30-frame 1920 x 1080 progressive, and 60-frame 1920 x 1080 interlaced.

- Video compression testing, using 26 difference HDTV sequences, showed that the Grand Alliance MPEG-2 (moving picture experts group) compression algorithm is "clearly superior" to the four original ATV systems in both the 1080 interlaced and 720 progressive scanning modes. Significantly, the testing also showed little or no deterioration of the image quality while transmitting 3 megabits-per-second of ancillary data.

- The 6-channel digital surround sound audio subsystem of the Grand Alliance system, known as Dolby AC-3, performed better than specifications in multichannel audio testing and met expectations in long-form entertainment listening tests.

- The packetized data transport subsystem performed well when tested to evaluate the switching between compressed data streams, robustness of headers and descriptors, and interoperability between the compression and transport layer. Additional testing also demonstrated the feasibility of carrying the ATV transport stream on an Asynchronous Transfer Mode (ATM) telecommunications network.

- Field and laboratory testing of the 8-VSB (vestigial sideband) digital transmission subsystem reinforced test results achieved in the summer of 1994 in Charlotte. Testing for spectrum utilization and transmission robustness again proved that the Grand Alliance system will provide broadcasters significantly better transmission performance than the current analog transmission system, assuring HDTV service "in many instances where NTSC service is unacceptable." Extensive testing on cable systems and fiber optic links of the 16-VSB subsystem also showed superior results.

The final technical report approved today by the Advisory Committee concluded, based on intensive laboratory and field testing, that the Digital HDTV Grand Alliance's digital television system is superior to any known alternative system in the world, better than any of the four original digital HDTV systems and surpasses the performance objectives of the ACATS.

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Digital HDTV Grand Alliance

AT&T

General Instrument

MIT

PHILIPS

Sarnoff

THOMSON

ZENITH

FACT SHEET

AUGUST 1996

DIGITAL HDTV GRAND ALLIANCE

Key Technical Elements of Grand Alliance System

The technologies that are at the heart of the digital high-definition television (HDTV) system expected to be adopted by the Federal Communications Commission reflect the Digital HDTV Grand Alliance's commitment to system excellence and responsiveness to the needs and concerns of consumers, broadcasters, cable operators, computer interests and the telecommunications industry. Key system elements include:

- **Digital video compression technology based on international standards.** The compression system used in the Grand Alliance system will be based on MPEG-2 (Moving Pictures Experts Group) Main Profile parameters, including the use of "B-Frames." (B-Frame or Bi-directional Frame motion compensation is a compression technique that improves picture quality.)

- **High-performance digital modulation technology for broadcasters and cable operators.** Developed by *Zenith Electronics Corporation*, the modulation subsystem used in the Grand Alliance HDTV system, the 8-VSB (vestigial sideband) transmission technology, is rugged digital technology for terrestrial broadcasting that assures a broad HDTV coverage area, reduces interference with existing analog broadcasts and provides immunity from interference into the digital signal. The higher-data-rate cable mode, 16-VSB, will allow operators to transmit two full HDTV signals in a single 6-MHz cable channel.

(MORE)

- **Telecommunications-like packets of digital data based on proposed international standards.** A packetized data transport system that allows the transmission of virtually any combination of video, audio and data packets -- similar to those used in state-of-the-art digital data communications networks -- will concentrate on features and services of MPEG-2 that are applicable to HDTV and provided for in the MPEG-2 transport layer.

- **Progressive scanning for computer interoperability.** The Grand Alliance uses both progressive and interlaced scanning. The formats are 24-, 30- and 60-frame-per-second progressive scan with a pixel format of 1280 x 720 (number of active picture elements per line times the number of active lines), and 24- and 30-frame-per-second progressive scan with a pixel format of 1920 x 1080. The system will also be capable of 60-frame-per-second interlaced scan with a pixel format of 1920 x 1080. These formats provide a good foundation for the migration to a 60-frame-per-second 1920 x 1080 progressive format as soon as technically feasible.

- **Compact-disc-quality digital surround sound.** The Grand Alliance system will use the 5.1-channel Dolby AC-3 audio technology.

* * *

Digital HDTV Grand Alliance

BACKGROUNDER AUGUST 1996

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DIGITAL HDTV GRAND ALLIANCE

Toward a New Era of Television in North America

On May 24, 1993, the three groups that had developed world-leading digital high-definition television (HDTV) systems agreed to produce a single, "best-of-the-best" system to propose as the standard for the next generation of TV technology. Since then, the three groups -- AT&T and Zenith Electronics Corporation; General Instrument Corporation and the Massachusetts Institute of Technology; and Philips Consumer Electronics, Thomson Consumer Electronics and the David Sarnoff Research Center -- have been working together as the "Digital HDTV Grand Alliance."

The Grand Alliance made tremendous progress in a short period of time. Working closely with the Federal Communications Commission (FCC) Advisory Committee on Advanced Television Service (ACATS), the Grand Alliance has finalized the specifications of its best-of-the-best system, developed and constructed a prototype system, delivered that system to the Advanced Television Test Center (ATTC), and cleared an exhaustive series of both laboratory and field tests. On November 28, 1995, Grand Alliance digital HDTV was approved unanimously by the Advisory

(MORE)

Committee, which called it "superior to any known alternative system in the world, better than any of its four original digital HDTV systems and surpasses the performance objectives of ACATS." The FCC is expected to adopt the new HDTV standard in late 1996 or early 1997, and the first HDTV sets should be available to the public during 1998 -- dovetailing with the beginning of HDTV broadcasts.

Broad-based benefits. The Grand Alliance represents a unique collaborative effort with a pool of technical talent and financial resources that should assure that digital HDTV is deployed first in North America. While previously the ACATS process of formulating an HDTV standard had concentrated on selecting the best system from among those proposed, the Advisory Committee process during 1994-95 focused on combining the best features of all the systems to produce a system superior to that of any one of the individual proponents.

The Grand Alliance approach is good news for everyone -- consumers; broadcasters; cable operators; the computer, consumer electronics and telecommunications industries; and U.S. workers. The new standard addresses the needs of these key constituencies and incorporates capabilities that are useful to each of them. For instance, the system incorporates progressive scan transmission capability and square pixel capability, two attributes that are extremely important for promoting interoperability with computers and telecommunications. Likewise, concerns expressed by many broadcasters have been addressed by including interlaced scan transmission in the initial deployment.

(MORE)

The Grand Alliance system will allow North America to maintain the worldwide technological lead it has established. The rapid adoption of an all-digital HDTV system in the United States, Canada and the rest of North America will promote the creation and maintenance of high-skilled jobs in the design and manufacture of HDTV receivers, displays, studio and transmission equipment, peripheral equipment, programming and software development, and especially in semiconductor products.

Key NII enabling technology. Because of the Grand Alliance system's interoperability between entertainment television and computer and telecommunications applications, the HDTV standard is expected to play a major role in improving the National Information Infrastructure (NII). Digital HDTV can be an engine that helps drive the evolution of the NII by advancing the deployment of receivers with high-resolution displays and creating a high-data-rate path to the home for a multitude of entertainment, education and information services. Specifically, Grand Alliance digital HDTV:

- Provides a broadband 20-megabit-per-second data pipeline (using a packetized data transport structure with headers and descriptors) into the home for a range of digital services and entertainment on a high-resolution HDTV display.

- Embodies key design elements to promote computer/telecommunications interoperability such as digital data, packetization, square pixels and progressive scanning.

- Offers broadcasters, cable operators and others critical on- and off-ramps for the digital Information Superhighway -- not only for serving consumers with entertainment and related digital services but also for other applications in education, healthcare and commercial services.

(MORE)

In the end, consumers will reap the benefits of the best technical minds collaborating to bring noise-free, theater-quality pictures and sound to American homes, as well as a host of new applications.

MAJOR PROGRESS

The HDTV standard-setting process has been and will continue to be a public, open process. Since its formation in May 1993, the Grand Alliance worked closely with the FCC's Advisory Committee to complete the standard and launch HDTV:

- The Advisory Committee assigned its Technical Subgroup to evaluate the Grand Alliance proposal in detail. The Technical Subgroup approved most of the key system elements -- video compression, transport, scanning formats and the audio subsystem -- in October 1993. The final element, the modulation subsystem, was approved by the Technical Subgroup in February 1994.

- In the summer of 1994, the transmission subsystem underwent three months of extensive broadcast and cable field tests in Charlotte, N.C. The tests proved that the Grand Alliance digital transmission technology will outperform today's analog transmission approach.

- Beginning in the spring of 1995, the Advisory Committee conducted extensive laboratory tests of the entire system in the U.S. and Canada to verify that the system meets its expectations.

- Following successful results of both laboratory and field testing, the Advisory Committee voted unanimously in November 1995 to recommend that the FCC adopt the Grand Alliance system as the basis of a new digital standard for terrestrial TV broadcasting.

- In May 1996, the FCC tentatively approved the ATSC standard based on the Grand Alliance system. The Commission is completing its rule-making process leading to the expected final adoption of the standard by late 1996 or early 1997. In accordance with FCC requirements, the technology will be licensed to anyone on reasonable terms.

* * *

Digital HDTV Grand Alliance

AT&T

General Instrument

MIT

PHILIPS

Sarnoff

THOMSON

Zenith

BACKGROUNDER AUGUST 1996

DIGITAL HDTV HIGH-DEFINITION TELEVISION:

Nearing the Finish Line in Nine-Year Process

The television that we watch today uses the NTSC (National Television Systems Committee) standard, finalized in the late 1940s. While that standard has been improved, most notably by the incorporation of color in the 1950s, today's television is based on the same fundamental resolution parameters as the original service, including 525 horizontal lines and interlaced scanning. The introduction of color TV four decades ago was the last major advancement in the NTSC standard. U.S. standardization activities were subsequently emulated throughout the world.

In the early 1980s, Japan's NHK proposed its analog "MUSE" HDTV interlaced system, based on 1,125 horizontal scan lines, and proposed its worldwide adoption. MUSE made the world aware of the goal of "high-definition television" (HDTV) with quality equivalent to motion pictures, including a wide-screen format. The MUSE system renewed concerns in the United States about the capabilities of American technology; many feared that American companies would be shut out of a fundamental new technology.

(MORE)

In 1987, at the request of U.S. broadcasters, the Federal Communications Commission (FCC) initiated its HDTV rulemaking and established a blue ribbon FCC Advisory Committee on Advanced Television Service (ACATS) for the purpose of recommending a broadcast standard. Former FCC Chairman Richard E. Wiley was appointed chairman of ACATS. Between 1987 and 1995, hundreds of companies and organizations worked together within the numerous subcommittees, working parties, advisory groups and special panels of ACATS. The ACATS process -- an impressive example of government-industry and inter-industry cooperation -- has been marked by many important accomplishments:

- ACATS developed a competitive process by which proponents of systems were required to build prototype hardware that would then be thoroughly tested. This process sparked innovation and an entrepreneurial response: initially there were 23 proposals for systems submitted to ACATS in September 1988. (Hardware was actually built and tested for six systems.)

- The FCC made several key spectrum decisions that also helped spark innovation. The Commission decided in early 1990 that new ATV systems would share television bands with existing services and would utilize TV channels as presently defined. The Commission also decided that a "simulcast" approach, first proposed by Zenith, would be followed. This meant that the new HDTV signals would be broadcast on currently unusable channels and that broadcasters would be temporarily assigned a second channel to accomplish the transition to HDTV.

- Although the FCC had said in the Spring of 1990 that it would determine if all-digital technology was feasible, most observers viewed it as at least 10 years in the future. That same year, General Instrument became the first to announce an all-digital system. Later, all-digital systems were announced by MIT, the Philips-Thomson-Sarnoff consortium and by Zenith-AT&T.

- Early in the process, the FCC and ACATS anticipated the need for interoperability of the standard with other media. Initially, the focus was on interoperability of the standard with cable television and satellite delivery, both crucial to any broadcast standard. MIT and Zenith-AT&T already had developed systems with computer-friendly progressive (non-interlaced) scanning. And, with the advent of all-digital systems, the value of interoperability with computer and telecommunications applications became increasingly apparent. In fact, ACATS formed a special subcommittee that worked for two years to assure that interoperability will be maximized in the new HDTV standard.

(MORE)

- As part of that effort, proponents later incorporated packetized transmission and headers and descriptors with the Philips-Thomson-Sarnoff consortium leading the way in this area. These features maximize the interoperability of HDTV with computer and telecommunications systems. The introduction of all-digital systems had made such interoperability a reality.

- All-digital systems set the stage for another important step, which was taken in February 1992, when the Advanced Television Systems Committee (ATSC) recommended that the new standard include a flexible, adaptive data allocation capability (and that the audio also be upgraded from stereo to surround sound).

- Six systems (four of which were all-digital) underwent extensive testing in 1991 and 1992 at the Advanced Television Test Center (ATTC) in Alexandria, Va. Also participating in testing were Cable Television Laboratories Inc. (CableLabs) of Boulder, Colo., which tested systems over a cable test bed at the ATTC, and the Advanced Television Evaluation Laboratory (ATEL) in Ottawa, Ontario, Canada.

- Following testing, the Advisory Committee decided in February 1993 to limit further consideration to the four all-digital systems: two systems proposed by GI and MIT, one proposed by Zenith and AT&T, and one proposed by Sarnoff, Philips and Thomson. The Advisory Committee decided that, while all of the digital systems provided impressive results, no single system could then be proposed to the FCC as the U.S. HDTV standard. The Committee ordered supplementary tests to evaluate improvements that had been made to individual systems since initial testing.

- At the same time, the Advisory Committee also adopted a resolution encouraging the digital HDTV groups to try to find a way to merge the four remaining all-digital systems into a single "grand alliance." The Committee recognized the merits of being able to combine the best features of those systems. With this encouragement, negotiations between the parties began in earnest, and on May 24, 1993, the seven companies involved announced formation of the Digital HDTV Grand Alliance.

- In March 1995, less than two years after its formation, the Grand Alliance successfully delivered a "best-of-the-best" digital HDTV system to ACATS for testing. By October 1995, the Grand Alliance system had distinguished itself in exhaustive laboratory and field tests. And on November 28, 1995, in the culmination of the ACATS process, the blue-ribbon advisory panel recommended unanimously that the FCC adopt the entire Grand Alliance system as the basis of a new digital television broadcast standard for the U.S.

- In May 1996, the FCC tentatively approved the ATSC standard based on the Grand Alliance system. The Commission is completing its rule-making process leading to the expected final adoption of the standard by late 1996 or early 1997.

* * *

HDTV--AN AMERICAN TECHNOLOGY SUCCESS

Today, the United States is on the threshold of bringing broadcast television into the digital age. Our world-leading digital high-definition television system (HDTV) represents a new era in broadcast communications.

As the first new television standard since 1952, digital HDTV will bring about remarkable improvement in the technical quality of television, and will provide numerous other services and applications to American citizens. HDTV's high resolution display and flexible data delivery capability make it an ideal backbone for improving the US information infrastructure, and will create and preserve thousands of high-skill, high-wage jobs.

THE BENEFITS OF HDTV

- **AMERICAN CONSUMERS WILL GAIN ACCESS TO THE WORLD'S MOST ADVANCED TELEVISION SYSTEM, ALONG WITH THE BENEFITS OF THE NATIONAL INFORMATION INFRASTRUCTURE.**
  Consumers will initially be attracted to HDTV by its incredibly crisp and clear video performance, as well as CD-quality sound. However, the flexible data delivery capability and high-resolution display inherent in HDTV will permit a wide variety of information and entertainment services to be received into the home. At last, the long-standing promise of the NII will become a reality for the vast American public.

- **FREE, OVER-THE-AIR BROADCAST TELEVISION WILL REMAIN COMMERCIALLY VIABLE.**
  Only by enabling broadcasters to implement HDTV can we ensure the long term viability of free over-the-air broadcasting, and guarantee that the entire American public--rural and urban, rich and poor--will have the opportunity to participate in the services and technologies associated with the digital age.

- **THE GOVERNMENT CAN REALIZE SIGNIFICANTLY GREATER REVENUE THROUGH THE AUCTION OF REPACKAGED, CONTIGUOUS CHANNELS RELINQUISHED BY THE BROADCASTERS.**
  Allowing broadcasters free use of the digital channels will encourage an expedited transition to HDTV, thus enabling the rapid return of one channel to the government. These returned channels could then be organized into nationwide, contiguous blocks. These blocks of spectrum would bring significantly greater market value than the auction of local, non-contiguous channels, such as those designated to be loaned to broadcasters for the digital transition.

- **THE UNITED STATES WILL MAINTAIN ITS TECHNOLOGICAL LEAD IN DIGITAL TELEVISION WHILE CREATING AND PRESERVING HIGH-SKILL, HIGH-WAGE JOBS FOR AMERICAN WORKERS.**
  The United States is now the world leader in digital television. If we move ahead rapidly with the implementation of HDTV, the effect on the US economy could be felt for decades through the creation and preservation of thousands of high-skill, high-wage jobs.

This moment marks a critical juncture in the development of advanced television. To maintain our momentum, the FCC must quickly move forward and adopt the digital HDTV standard. It is equally critical that local broadcasters be assigned HDTV transition channels as rapidly as possible. Any delay at this point would squander the fruits of eight years of work and hundreds of millions of dollars invested, while needlessly delaying the thousands of new, high-quality jobs that will be created by transition to digital broadcast.

HDTV is an American technology success. Our commitment to the rapid deployment of HDTV will ensure the United States' economic leadership, international competitiveness, and quality of life well into the 21st century.

2/96

HDTV--MYTHS AND FACTS

Myth: Consumers don't want HDTV.

Fact: It is circular logic to argue that there is no market demand for a product that is not yet on the market. Consumers were not clamoring for VCRs in the 1960s or CD players in the 1970s. The fact is, from black and white TV to color, from phonographs to CDs, the American consumer has never passed up an offer of improved audio and video performance.

HDTV is no different. Every study shows that Americans want the best possible television picture. The only reliable way to determine whether there is a market demand for HDTV is to make it available to 100% of the consuming public via free over-the-air, broadcast television.

Myth: Standard definition digital television (SDTV) is perfectly adequate, so there is no need to allocate to broadcasters the full 6 Mhz of spectrum that HDTV requires.

Fact: From a consumer perspective, HDTV's revolutionary picture and sound quality will represent the principal qualitative difference between analog and digital television. Consumers cannot reasonably be expected to invest in digital receivers just to watch the digital equivalent of the analog-quality pictures they already have. HDTV's quantum leap in performance will give consumers the greatest incentive to make the transition to digital television.

Myth: The temporary allocation of spectrum to the broadcasters is a "giveaway".

Fact: Allowing broadcasters the temporary use of the spectrum does not, by any definition, constitute a "giveaway". Instead, spectrum will be loaned to broadcasters so that they can simultaneously broadcast in analog and digital for a limited period of time. The spectrum cannot be retained by the broadcasters--it is a one-for-one exchange. At the conclusion of the transition, one channel is required to be returned to the government. Throughout this process the government controls ownership of the spectrum.

Myth: In order to balance the budget, the spectrum designated for HDTV should be auctioned to the highest bidder as soon as possible.

Fact: Auctioning the digital spectrum now will neither promote the conversion to digital television nor maximize the government's financial return. By contrast, the returned analog channels could be packed into nationwide, contiguous blocks that will bring significantly more revenue at auction. An immediate auction will forsake revenue and delay, if not kill, the transition to digital TV.

Myth: HDTV will be too expensive for the average consumer.

Fact: In the consumer electronics business, first generation products are initially expensive. When introduced, the first color TVs cost as much as a new automobile. Placing HDTV before the public will attract the early adopters, build volume, drive cost reduction, and make receivers available to the entire consumer market. In addition, those consumers who wish to enjoy digital broadcast program offerings without purchasing a digital receiver will have access to less expensive digital converter set-top boxes.

In today's consumer electronics market, many Americans of modest means place a premium on televised entertainment and invest in high-end products such as large-screen television sets.

HDTV BENEFITS ALL AMERICANS

HDTV offers viewers a revolutionary improvement in video performance.
HDTV offers extraordinarily crisp and clear video performance, providing approximately six times the spacial resolution of current NTSC sets. The pictorial acuteness of digital transmission will eliminate "ghosts" and other annoying broadcast picture artifacts.

HDTV gives listeners the benefit of crisp digital sound.
HDTV also offers CD-quality sound. The Grand Alliance HDTV system incorporates Dolby AC-3 technology, which is the same digital surround-sound used in movie theaters. This multi-channel digital audio system is suitable for inexpensive televisions with built-in speakers and more expensive home theater systems.

HDTV provides the public with an "on-ramp" to the NII.
Despite all the publicity, access to the world wide web and other benefits of the NII have been reserved for a relatively small segment of the public. HDTV will finally bring the NII to the American home by proving a high-bandwidth, high-resolution interactive device that can be operated by every TV viewer.

HDTV will allow doctors to make use of remote medical applications.
The use of telemedicine is dependant on the availability of the ultra-high video resolution required to allow remote diagnosis and analysis. HDTV will enable doctors and patients across the country to make increased use of remote medical applications, and allow remote communities to gain access to the expertise and resources of major urban hospitals.

HDTV offers teachers and students a powerful new educational tool.
HDTV gives educators a powerful teaching tool that transmits massive amounts of audio, video and data. From elementary school children to students in graduate science programs, all students have the ability to benefit from HDTV's ability to transmit massive amounts of audio, video, and data directly to the classroom.